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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/567,824

02/10/2006

Tsukasa Takahashi

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EXAMINER

HU, RUI MENG

ART UNIT

PAPER NUMBER

2618

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/567,824	Applicant(s) TAKAHASHI ET AL.	
	Examiner RuiMeng Hu	Art Unit 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some    \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/10/2006, 3/28/2007</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

2. The information disclosure statements submitted on 2/10/2006 and 3/28/2007 have been considered by the Examiner and made of record in the application file.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claims 1-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kouyama (US Patent 6643497)** in view of **Hosonuma et al. (JP 11-251956)** and **Imagawa (JP 2000-124723)**.

Consider **claim 1**, Kouyama discloses an antenna matching apparatus (figure 8) comprising: a plurality of antenna elements (antennas 1 and 1A); matching sections respectively connected to said antenna elements that adjust impedance (matching circuits 11-12 and 11a-12a); figure 8 column 10 line 59-column 11 line 41 (The third and fourth impedance matching circuits 11A and 12A have different impedance values from each other. Specifically, the impedance value of the third impedance matching circuit 11A is defined so as to match the impedance values of the antenna 1A and the radio section 20 when the antenna 1A is not placed near a human body nor contacted therewith. The impedance value of the fourth impedance matching circuit 12A is defined so as to match the impedance values of the antenna 1A and the radio section 20 when the antenna 1A is placed near a human body or contacted therewith).

Kouyama fails to disclose a first detection section that detects any one of a signal reflected when power is supplied to said antenna elements, reflection coefficient and voltage standing wave ratio; a second detection section that detects signals received by said antenna elements.

In the same field of endeavor, Hosonuma et al. disclose a first detection section that detects any one of a signal reflected when power is supplied to said antenna elements, reflection coefficient and voltage standing wave ratio; a second detection section that detects signals received by said antenna elements (paragraphs 14-19, drawing 1).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the selection techniques taught by Hosonuma et al. into the art of Kouyama as to include detection sections to tune matching section for reducing the impedance mismatching during reception and transmission.

Kouyama fails to disclose a storage section that stores control information on said matching sections in a one-to-one correspondence with the distances between the human body and antenna elements; and a control section that adaptively controls said matching sections using the control information stored in said storage section so as to achieve an impedance matched state.

In the same field of endeavor, Imagawa discloses a storage section that stores control information on said matching sections (matching circuit 3) in a one-to-one correspondence with the distances between the human body and antenna elements;

Art Unit: 2618

and a control section that adaptively controls said matching sections using the control information stored in said storage section so as to achieve an impedance matched state (paragraphs 22-23,45-48).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the selection techniques taught by Imagawa into the art of Kouyama as to improve the impedance matching apparatus.

Consider **claim 2 as applied to claim 1**, Kouyama as modified by Hosonuma et al. and Imagawa discloses wherein when said control section adaptively controls said matching sections so that the value detected by said first detection section decreases or the value detected by said second detection section increases, said control section completes adaptive control processing on any one of said plurality of antenna elements, reads other control information corresponding to the control information at that time from said storage section and adaptively controls matching sections of other antenna elements using the read control information (Imagawa discloses a control means 5 comprises a memory, said control means 5 tunes the antenna matching circuit 3 based on the distance between the antenna and human body, as a result the impedance mismatching is reduced thus the reflected signal detected by the first detection section decreases or the value detected by said second detection section increases).

Consider **claim 3 as applied to claim 1**, Kouyama as modified by Hosonuma et al. and Imagawa discloses wherein said control section adaptively controls said matching sections based on a transmission evaluation function expressed by a predetermined multiple of a function including a reflected signal detected by said first

detection section and a reception evaluation function expressed by a predetermined multiple of a function including a received signal detected by said second detection section (Hosonuma et al. paragraphs 24-31, carrying out quality evaluation by comparison).

Consider **claim 4 as applied to claim 1**, Kouyama as modified by Hosonuma et al. and Imagawa discloses wherein said storage section prestores control information that an impedance matched state is set when the antenna element is placed close to the human body and control information that an impedance matched state is set when the antenna element is not placed close to the human body, and said control section starts adaptive control processing using any of the control information stored in said storage section as initial control information (Imagawa paragraphs 22-23, 45-48, a control means 5 memorizes the result as shown in drawing 3 the characteristic curve).

Consider **claim 5 as applied to claim 4**, Kouyama as modified by Hosonuma et al. and Imagawa discloses further comprising an input section whereby the user inputs information on whether or not the antenna element is placed close to the human body to said control section (Imagawa discloses using ultrasonic sensors to determine the distance between the antenna element and the human body, however, Official Notice is taken that the teaching of a mobile device controlled by a user input means is well known in the art, therefore a person skilled in the art would easily include the teaching).

Consider **claim 6 as applied to claim 1**, Kouyama as modified by Hosonuma et al. and Imagawa discloses wherein a variable capacitance capacitor is used as said

matching section and the capacitance value of said variable capacitance capacitor is used as control information (Imagawa paragraph 48).

Consider **claim 7 as applied to claim 1**, Kouyama as modified by Hosonuma et al. and Imagawa discloses wherein a variable capacitance diode is used as said matching section and a control voltage to be applied to said variable capacitance diode is used as control information (Imagawa paragraph 48).

Consider **claim 8 as applied to claim 1**, Kouyama as modified by Hosonuma et al. and Imagawa discloses wherein said matching section comprises a plurality of capacitors having different capacitances and a switch section that selectively switches between said plurality of capacitors (Imagawa paragraph 48).

Consider **claim 9 as applied to claim 1**, Kouyama as modified by Hosonuma et al. and Imagawa fails to discloses wherein said antenna element comprises different resonance frequencies.

However, Official Notice is taken that the teaching of an antenna element comprises different resonance frequencies is well known in the art.

Therefore, a person skilled in the art would easily include the teaching for transmitting and receiving signals over different channels.

Consider **claim 10 as applied to claim 1**, Kouyama as modified by Hosonuma et al. and Imagawa discloses wherein said control section performs adaptive control processing in timing slots other than transmission slots and reception slots (Imagawa discloses the characteristic curve of drawing 3 is stored in the control means 5, thus the



processing of tuning the antenna matching circuit 3 could be carried out during timing slots other than transmission slots and reception slots).

### ***Conclusion***

Any response to this Office Action should be **faxed to (571) 273-8300 or mailed**

**to:** Commissioner for Patents  
P.O. Box 1450  
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**Hand-delivered responses** should be brought to

Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RuiMeng Hu whose telephone number is 571-270-1105. The examiner can normally be reached on Monday - Thursday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on 571-272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Application/Control Number: 10/567,824

Page 9

Art Unit: 2618

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Business Center (EBC) at 866-217-9197 (toll-free).

*RuiMeng Hu*

R.H./rh

June 23, 2007

EDAN ORGAD  
PRIMARY PATENT EXAMINER

*Edan Orgad* 6/25/07